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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------------|------------------------|
| 10/730,230 | 12/08/2003 | Bishnu P. Gogoi | SC12116ZP | 2513 |
| 23125 7590 01/10/2008 FREESCALE SEMICONDUCTOR, INC. LAW DEPARTMENT 7700 WEST PARMER LANE MD:TX32/PL02 AUSTIN, TX 78729 | | | EXAMINER ESTRADA, MICHELLE | |
| | | | ART UNIT 2823 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-------------------------------|------------------------------|--|
| Office Action Summary | Application No. 10/730,230 | Applicant(s) GOGOI ET AL. | |
| | Examiner Michelle Estrada | Art Unit 2823 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 14-17 and 19-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23 is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-17, 19-22, 24 and 25 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the gap formed between the semiconductor substrate and the layer (claim 1); and etching the layer to expose a portion of the sacrificial layer and removing the sacrificial layer to form a gap (claim 14) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no description in the specification as originally filed of "forming a gap between the semiconductor substrate and the layer". There is only seen description of "forming a opening within the layer or through the layer".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 9-11, 14, 15, 17, 19, 20, 24 and 25 are rejected under 35 U.S.C.

103(a) as being unpatentable over Partridge et al. (6,936,491) in view of Razouk et al. (5,911,109).

Re claims 1 and 2, and 24, Partridge et al. disclose providing a semiconductor substrate (14); forming a layer over the semiconductor substrate (24), wherein forming the layer over the semiconductor substrate comprises forming a conductive layer; forming an opening within the layer (Fig. 4A)); forming (depositing) an insulating layer (32) over the layer.

Partridge et al. do not disclose that the insulating layer is deposited at approximately atmospheric pressure.

Razouk et al. disclose depositing an insulating layer in a trench at approximately atmospheric pressure that would obviously seal the opening (Col. 1, lines 57-65).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Partridge et al. and Razouk et al. to enable the insulating layer formation step of Partridge et al. to be performed according to the teachings of Razouk et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed insulating layer formation step of Partridge et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, it will avoid the presence of voids within the trench fill material and to form a planar surface.

Re claims 4 and 17, Razouk et al. disclose wherein forming the insulating layer further comprises depositing the insulating layer and annealing the insulating layer at approximately atmospheric pressure.

Re claim 9, Razouk et al. disclose wherein annealing comprises reflowing the insulating layer.

Re claim 10, Partridge et al. disclose wherein forming the layer over the semiconductor substrate comprises forming a polysilicon layer (Col. 6, lines 50-53).

Re claims 11, 19 and 20, Razouk et al. disclose wherein forming an insulating layer comprises forming a phosphosilicate glass (PSG) (Col. 1, lines 55-57).

Re claims 14 and 25, Razouk et al. disclose providing a semiconductor substrate; forming a sacrificial layer over the semiconductor substrate (106); forming a layer over the sacrificial layer (108); etching the layer to expose a portion of the sacrificial layer; removing the sacrificial layer; forming an opening within the layer (302); forming a material over the opening (802); and sealing the opening with the material, wherein sealing occurs at approximately atmospheric pressure (Col. 1, lines 57-65).

Re claim 15, Razouk et al. disclose wherein forming the material and sealing the opening are performed simultaneously.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 5-8, 16, 21 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Partridge et al in view of Razouk et al. as applied to claims 1, 2, 4, 9-11, 14, 15, 17, 19 and 20 above, and further in view of the following comments.

Re claims 3 and 16, the combination does not disclose wherein the depositing is performed by CVD.

However, the Examiner takes official notice that depositing an insulating layer by CVD is well known in the art at the time of Applicant's invention. It would have been obvious to one of ordinary skill in the art to deposit the insulating layer by CVD to achieve the instant invention.

Re claims 5-8, 21 and 22, Razouk et al. do not specifically disclose a type of annealing process.

The Examiner takes official notice that furnace anneal, localized anneal, annealing in dopant atmosphere and laser anneal are well known in the art at the time of Applicant's invention. It would have been obvious to one of ordinary skill in the art to use any of these types of anneal to achieve the instant invention. See Sze, "VLSI Technology", pages 355-362.

Allowable Subject Matter

Claim 23 is allowed.

Claims 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 10/23/07 have been fully considered but they are not persuasive. Applicant argues that the combination does not disclose closing the gap off to the environment. However, the same materials are treated in the same manner, therefore it would be obvious to one of ordinary skill in the art that the gap would be close off to the environment with this procedure. The process suggested by the reference alone or in combination with the remaining references is encompassed by the instant claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Michelle Estrada". The signature is fluid and cursive, with the first name "Michelle" written in a larger, more prominent script than the last name "Estrada".

Michelle Estrada
Primary Examiner
Art Unit 2823

ME
January 7, 2008